Environmental Assessment
To amend the
Manti-La Sal National Forest Land and Resource Management Plan to replace the Blue Grouse with the Northern Goshawk as a Management Indicator Species

June 2003

Cover Sheet

Proposed Action:	The Manti-La Sal National Forest proposes to replace the blue grouse with the northern goshawk as a Forest Plan Management Indicator Species.
Type of Document:	Environmental Assessment
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Table of Contents

Chapter I. Purpose and Need

1.1 Purpose and Need

The Manti-La Sal National Forest (hereafter referred to as the Forest Service) is currently faced with the problem of addressing a shortage of data surrounding one of its Management Indicator Species (MIS), the blue grouse. The 1986 Manti-La Sal Land and Resource Management Plan (Forest Plan) designated blue grouse as the MIS for mature conifer/mixed conifer habitats. However in the early 1990's the Utah Division of Wildlife Resources (LMRP pg II-33) who had been monitoring blue grouse populations, decided to discontinue collecting this data. The resulting data gap and the implications for MIS monitoring requirements were highlighted in litigation on the South Manti Timber Sale in 2002.

This situation prompted the Forest Supervisor to direct an evaluation (Appendix B) of whether continuing with blue grouse as the MIS for the mature conifer/mixed conifer habitat component and reinitiating data collection was a desirable and practical approach to meeting the intent of the regulations. Other species tied to this habitat for which population data might be more readily available needed to be considered as well. Guidance for MIS is provided in 36 CFR 219 subsection 19, which sets forth the requirements for monitoring wildlife habitat and the use of MIS within the context of developing, adopting, and revising land and resource management plans for the National Forest System (as required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended). 36 CFR 219.19 requires that viable populations of native and desirable non-native vertebrate species be maintained at the planning area level (generally considered to be a National Forest). The regulations require the use of MIS populations to reflect the effects of management activities on habitats and population trends.

1.3 Proposed Action

Based on the evaluation conducted, the Manti-La Sal National Forest is proposing a Forest Plan Amendment to replace blue grouse with northern goshawk as a Management Indicator Species (MIS) for mature conifer/mixed conifer habitats. The Amendment would consist of replacing Manti-La Sal Forest Plan language for blue grouse with comparable language for the goshawk as a MIS. The Plan already contains standards and guidelines as well as monitoring direction for northern goshawk as a result of a March 2000 Forest Plan Amendment.

1.4 Decisions to Be Made

The Forest Service needs to decide whether or not to replace the blue grouse as a Management Indicator Species (MIS) for evaluating effects on wildlife populations in mature conifer/mixed conifer habitats with the northern goshawk to better meet the

requirements of 36 CFR 219.19. The deciding official also needs to determine whether this is a significant or non-significant amendment.

1.5 Forest Plan Direction

The Manti-La Sal National Forest Land and Resource Management Plan was completed in 1986. It continues to provide direction until a revised Forest Plan is written and signed, which is not expected until 2005.

1.5.1 Manti-La Sal Land and Resource Management Plan

The Manti-La Sal National Forest Land and Resource Management Plan (Forest Plan) guides all natural resource management activities and establishes management direction including Standards, Guidelines, and monitoring requirements for the Manti-La Sal National Forest. The Forest Plan embodies the provisions of the National Forest Management Act (NFMA), the regulations, and other guiding documents.

1.5.2 Management Indicator Species

Management Indicator Species are a group of species "selected because their population changes are believed to indicate the effects of management" (36 CFR 219.19(a)(2)). Rather than try to monitor all wildlife populations for each vegetation or habitat type, MIS are used to focus survey and monitoring efforts. Criteria used in selecting MIS are identified on page II-31 of the Forest Plan and include:

-Threatened, endangered, and sensitive species
-Special habitat indicators
-Economically or socially important species
-Ecological indicators

"Population trends of MIS will be monitored and relationships to habitat changes determined" (36 CFR 219.19(a)(6)). Forest Plan page IV-6 identifies monitoring techniques and frequencies for each MIS.

Chapter II. Alternatives Including the Proposed Action

2.1 Introduction

Five alternatives were initially considered based on internal and public scoping. Two of these including the No Action Alternative are considered in detail with the other three alternatives dismissed for reasons explained below in section 2.4.2.

2.2 Public Involvement

Public scoping began February 18, 2003 with 244 letters sent to agencies, organizations and individuals with interest in this proposal, including the UDWR and U.S. Fish and Wildlife Service. Public notices were placed in the *Ephraim Enterprise* (Ephraim, UT), *Emery County Progress* (Ferron, UT), *Sun Advocate* (Price, UT), *Times Independent* (Moab, UT), and *San Juan Record* (Monticello, UT) newspapers. A notice was also listed in the April 2003 quarterly Schedule Of Proposed Actions which is mailed to about 240 interested parties. The formal scoping period ended on March 21, 2003. Six letters of comment were received. Responses to these comments are attached as Appendix C.

2.3 Issues and Evaluation Criteria

Public comment did not surface any issues that had not already been identified as part of developing the Proposed Action. Two issues were identified during the evaluation of MIS directed by the Forest Supervisor and validated by public comments as follows:

Issue 1: The Forest Service does not have adequate MIS data to evaluate effects on wildlife populations in mature conifer/mixed conifer habitats as required by 36 CFR 219.19. The current MIS for this type, blue grouse, is affected by a number of factors that make a cause-effect relationship with forest management activities difficult or impossible to determine.

Evaluation Criteria: Ability to evaluate effects on population trends from Forest Service management activities within the mature conifer/mixed conifer vegetation habitat type.

Issue 2: It is not possible currently to accurately evaluate changes in grouse population because there is no standard protocol for monitoring.

Evaluation Criteria: Ability to employ effective, efficient standard population monitoring protocols.

With regard to the Proposed Action, the question to be answered in this analysis is: Will replacement of blue grouse with northern goshawk as MIS in the Manti-LaSal Forest Plan better meet requirements for MIS at 36 CFR 219.19?

2.4 Alternatives

2.4.1 Alternatives Considered in detail

Alternative 1: <u>Keep Blue Grouse as a MIS</u> (No Action)

Blue grouse would remain as a Management Indicator Species for mature conifer/mixed conifer habitat types. The Forest Service would need to design

and implement a monitoring protocol for blue grouse to collect data previously provided by the Utah Division of Wildlife Resources (LMRP II-33).

Monitoring

Monitoring of blue grouse as a MIS is identified on page IV-6 of the Forest Plan. The following table outlines what is expected:

Data Source and / or Monitoring Technique	Expected Reliability	Measurement Frequency	Reporting Period	Variation resulting in further evaluation
Harvest Records	M	Annual	5 Year	Twenty Percent
Spring Territory Surveys	M	Annual	5 Year	Twenty-five Percent
Summer Brood Counts	M	Annual	5 Year	Twenty-five Percent

Alternative 2: <u>Use Northern Goshawk as a MIS</u>

This alternative would replace the blue grouse with the northern goshawk as a Management Indicator Species for mature conifer/mixed conifer habitats in the Manti-La Sal Forest Plan.

Monitoring requirements for northern goshawks are already outlined in the March, 2000 Utah Northern Goshawk Project Forest Plan Amendment and the Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah (Utah National Forests et al.1998, pages 9-10). The following excerpts from Appendix D provide direction for monitoring of this species and are consistent with the forest plan as amended.

1. Tracking changes in goshawk habitat over time

This type of monitoring will occur on state and federal lands, statewide. Each National Forest will monitor its forested landscapes for the attributes described in the DHC statements provided earlier (Desired Habitat Condition in the Conservation Strategy, ie. early seral tree species, habitat connectivity, large trees, stand level characteristics such as snags and down woody debris, and a variety of vegetative structural stages). At the Forest level this is accomplished by identifying changes in habitat caused by management activities or natural events. When conditions at the Forest level are trending away from DHCs, appropriate corrective actions will be developed and implemented. Results of

Forest-level monitoring will also be aggregated to a central repository at the state level in order to monitor the quality and connectivity of statewide habitat. State-wide assessments will also be completed during programmatic planning activities such as Land Resource Management Plan revisions.

2. Implementation and effectiveness monitoring

   This monitoring will be conducted to verify that projects are properly implementing the strategy, and that they are effective in creating desired habitat conditions for goshawk and it's prey. It will be part of the design of every project affecting goshawk habitat on National Forest system lands. Time periods and indicators for monitoring will vary depending upon the purpose of the project. Time periods and indicators at the project level will be documented within individual project records. At the Forest and statewide levels, monitoring will track the net change in availability and connectivity of high value goshawk habitat. This monitoring will be reviewed annually at the state level to determine if the strategy is being successfully implemented or if changes are needed.

3. Population Monitoring

   Concurrent with habitat monitoring, Forests will monitor goshawk territory occupancy. Data will be collected and analyzed at the Forest level and shared with the Utah Division of Wildlife Resources for aggregation to larger scales, including the State. A territory is considered occupied if evidence of goshawk use is present. Nesting does not need to occur for a territory to be occupied. Each agency will be responsible for maintaining and updating their respective population databases, and coordinate findings annually.

2.4.2 Alternatives Considered but Eliminated from Detailed Analysis

Three other species were considered as possible MIS to replace blue grouse given issues identified; gray jay, three-toed woodpecker, and red squirrel. None of the three species were proposed as a fully analyzed alternative since all three species have nests that are difficult to locate and none have standard survey protocols. In addition, the gray jay nests in *young* spruce and three-toed woodpecker populations fluctuate with beetle numbers, factors which make them ineffective for the stated purposes of MIS. Additional discussion of these species is included in Appendix B, "Management Indicator Species Process Paper for the Manti-La Sal National Forest" Page 34.

Chapter III. Affected Environment and Environmental Consequences

3.1 Introduction

The proposed amendment would pertain to all mature conifer/mixed conifer forests within the Manti-La Sal National Forest. Mixed conifer includes some variety of Douglas fir, white fir, subalpine fir, and aspen trees. According to the July 1998 draft Properly Function Condition Assessment for the Manti-La Sal National Forest, the following describes properly functioning conditions for mixed conifer forests:

10% grass/forb	Endemic insect and disease
10% seedling/sapling	populations, Mixed-severity fire
20% young forest	regime with an interval of 30-50 yrs.
25% mid aged forest	Fire maintains seral aspen component.
25% mature forest	
10% old forest	

According to the 1986 Manti-La Sal Forest Plan, the numbers of acres for spruce/fir/aspen vegetation types are as follows:

Engleman Spruce	74,100
Alpine Fir	36,800
Douglas Fir	31,400
Aspen	154,600
Total	402,500 acres

3.2 Existing Condition

Blue grouse (*Dendragapus obscurus*)

Currently the forest service has a data gap on population information for the blue grouse from 1991 until present. Protocols for collection of population data on this species have not been established. Appendix B (Section 4 pg. 22-25) includes a discussion of blue grouse life history, habitat requirements, and management effects. In summary, they use dense mature coniferous forests in winter and migrate to lower elevation meadows, brush or open timber in spring. No major reduction in blue grouse range has occurred since historical times in Utah or throughout western North America. Populations fluctuate annually and are affected by weather patterns, hunting, and predation.

Northern Goshawk (Accipiter gentilis)

The forest service has continuous data on goshawk populations since 1992 (File 2670 TES Goshawk Data Summary Project file) through the implementation of an established monitoring protocol. Appendix B (pg. 27-29) includes a discussion of northern goshawk life history and habitat requirements, and

management effects. In summary, they use mature conifer and mixed conifer forests for all aspects of life. Populations are not affected by hunting, and predation by large raptors affects primarily the young.

Data has been collected from all national forests within Utah describing habitat characteristics of areas occupied by goshawks. The data includes nesting habitat, nest site characteristics, foraging habitat and nonbreeding season habitat. This information was compiled at a large scale in the publication *The Northern Goshawk in Utah: Habitat Assessment and Management Recommendations* (Graham et al. 1999).

In addition to listing the vegetation types currently occupied by goshawks, habitat was mapped according to its potential to support goshawks as well. The habitat is further defined as high value habitat where nesting and *at least one* forage value is high. Optimum habitat is defined where nesting and *all* forage values are high. Forage values include such things as stand structure, patch size, landscape features, snags, etc. The document also describes trends and risks to habitat and makes recommendations for management.

3.3 Effects of Alternatives

Alternative 1- Keep Blue Grouse as MIS

• Evaluation Criteria:	Ability to evaluate affects on population changes from Forest Service management activities within the mature conifer/mixed conifer vegetative community.

Blue grouse depend on many different vegetation types throughout its life. Negative affects to one of those habitat types would take longer to detect through population monitoring and may not appear as severe as it would if the blue grouse were dependent on a single habitat type. Its sensitivity to changes in the mature conifer / mixed conifer environment is compromised since it does not depend on mature conifer and mixed conifer for breeding success. This makes blue grouse less effective as a MIS because its population changes cannot be tied to management effects on a particular vegetation type.

Blue grouse can be affected by forest management activities. Such effects are typically not exclusive, nor rarely even primary. Vegetation management may alter blue grouse habitat, but because blue grouse use a variety of habitat types, they can adjust to utilize altered habitat or other habitats. For example, timber

harvest activities may displace blue grouse through disturbance and in some cases habitat lost, but blue grouse will likely remain in the area as long as a variety of key habitat components (forage, cover, movement corridors, security area) are present. They may also move to adjoining non-forested habitats where their needs are also met (USFWS 1984).

Blue grouse are a hunted species and are subject to predation because of their position in the middle of the food chain, both factors making it more difficult to tie population trends to management activity effects on habitat. Retention of blue grouse as the management indicator species for mature conifer/mixed conifer habitats will leave land managers with a lack of adequate monitoring data for evaluating effects of management activities at both site-specific and broader scales.

• Evaluation Criteria:	Ability to employ effective, efficient standard population monitoring protocols.

No survey protocol for blue grouse has been established. Surveys conducted to date are field surveys done in conjunction with projects. While this does provide some population data, without the uniformity provided by a survey protocol correlation of the data is difficult. The Forest Service would need to work with other agencies to develop and facilitate peer review of a standard protocol. Data collection would need to be re-initiated (since it was discontinued in the early 1990's) and it would be some time before trend data was available.

Even with data available, for reasons described above, it would be difficult to fulfill the intent of MIS given the variety of habitats used by blue grouse.

Alternative 2- <u>Use Northern Goshawk as an MIS</u>

• Evaluation Criteria:	Ability to evaluate affects to population changes from Forest Service management activities within the mature conifer/mixed conifer vegetative

The northern goshawk is a U.S. Forest Service Sensitive Species for Region 4. It depends on mature conifer and mixed conifer forests for all aspects of life, with the exception of those individual birds that migrate to lower elevations during winter months. Goshawks are sensitive to ecological changes because all or most life stages rely on mature conifer/ mixed conifer (spruce/fir/aspen forests),

particularly for breeding success. Changes to goshawk populations are directly linked to changes occurring any time of the year to this habitat type.

For example, timber harvest activities may displace goshawks through disturbance and in some cases habitat lost. However, unlike blue grouse, goshawks will likely not remain in the area or move to adjoining non-forested habitats since their needs would no longer be met in either case. Therefore, monitoring their occupancy can detect impacts from habitat manipulation.

Northern goshawks are not a hunted species and are high on the food chain. These factors reduce complexity and improve the ability to correlate population trends with effects of management activities on habitat. Selection of northern goshawk as the management indicator species for mature conifer/mixed conifer habitats will provide land managers with scientifically credible monitoring data for evaluating effects of management activities at both site-specific and broader scales.

- Evaluation Criteria: Ability to employ effective, efficient standard population monitoring protocols.

A survey protocol for the northern goshawk has been established (Appendix D) and is being used throughout Utah and other western states. This has allowed comparable data to be acquired over large landscapes and geographic areas. This data can be used to determine large scale changes in populations and possible cause-effect relationships such as effects of habitat fragmentation.

3.4 Comparison of Alternatives Using Evaluation Criteria

The chart below summarizes how Alternatives compare using evaluation criteria.

Eval. Criteria	Blue Grouse	Northern Goshawk
Ability to evaluate effects on populations from F.S. activities in mature conifer/mixed conifer habitat	**LOW** Habitat generalist- Mature conifer, mixed conifer- for the winter; Meadows, brush, open timber-for the summer	**HIGH** Habitat specific- Mature Conifer/mixed conifer for all life stages
	Hunted Species	Non-hunted Species
	Middle of Food Chain, many predators	Top of Food Chain, few predators
Ability to employ effective, efficient standard population	**LOW** No survey protocol established	**HIGH** Survey protocol established

monitoring protocols.		
	Difficult to obtain reliable cost-effective population data	Much easier to obtain reliable cost-effective population data
	Site-specific data available only	Site-specific as well as regional data available

Chapter IV. References

CFR. Code of Federal Regulations.1982. 36 CFR 219.19.

Dean Mitchell, April 2003, UDWR Upland Game Bird Coordinator. Personal communication with Brian Ferebee, Region 4 Wildlife Coordinator, USFS.

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USDA Forest Service. 1986. Final Environmental Impact Statement and Record of Decision for the Manti-La Sal National Forest Land and Resource Management Plan 11/86.

USDA Forest Service. 2000. Decision Notice, Finding of No Significant Impact, Finding of Non-Significant Amendment Utah Northern Goshawk Project.

USFWS 1984. *Habitat Suitability Index Models: Blue Grouse*. Richard L. Schroeder, Habitat Evaluation Procedures Group. FWS/OBS-82/10.81 August 1984.

Utah National Forests, Bureau of Land Management, Utah Division of Wildlife Resources, and U.S. Dept. of Fish and Wildlife Service. 1998. *Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah*.

Appendix A

MANTI-LASAL FOREST PLAN AMENDMENT
Utah Northern Goshawk Project

The following conventions are used in this document:

Italicized print is text copied from the current Manti-LaSal Forest Plan.
Normal print is used for the amendment language.
(Guideline) and ***(STANDARD)*** labels are bold and italicized in the amendment language.

Pg. III-3

Protect, maintain, and/or improve habitat for threatened or endangered and sensitive plants and animals.

Restore or maintain forested landscapes in a properly functioning condition (PFC). Functioning forested landscapes provide habitat for the northern goshawk and its prey to support a viable population of goshawks in Utah.

Objective: For the remainder of the current planning period, prioritize treatment on at least 1000 acres where goshawk habitat areas are rated as high or optimum quality (per the process in Graham et al. 1999), and that are functioning-at-risk.
Implement treatments that will provide reasonable assurance that areas will not drop to low to moderate value.

Additional forest-wide direction follows that has been added to the Standards and Guidelines for the Wildlife, with cross-references to this amended direction other resource areas.

Pg. III-19

Mgt. Act.	**GENERAL DIRECTION**	**STANDARDS & GUIDELINES**
(A16)	*02 Act on special-use applications according to the following priorities:*	c. Refer to the new **guideline** q. for issuing permits in goshawk habitat.

Pg. III-22

Mgt. Act.		**GENERAL DIRECTION**	**STANDARDS & GUIDELINES**
(*C01)*	*04*	*Maintain and/or improve habitat and habitat diversity for minimum viable populations of existing vertebrate wildlife species.*	*a. Manage at least 5 percent of forested areas in mature timber stands* Refer to the new **Guideline e.** for management of mature and oldgrowth stands in goshawk habitat.
(C01)	*06*	*Provide for habitat needs of cavity nesting birds, raptors and small animals by:*	Refer to the new **Guideline** f. for snag direction in goswhawk habitat
(C01)	*07*	*Manage down timber to provide habitat for wildlife.*	Refer to the new **Guideline g.** for direction for down logs in goshawk habitat.

Pg III-24

Mgt. Act.		**GENERAL DIRECTION**	**STANDARDS & GUIDELINES**
(D02)	*03*	*Manage livestock and wild herbivores forage use by implementing proper use criteria as established in the Allotment Management Plan.*	a. Refer to the new **Guideline v.** for grazing management analysis in goshawk habitat.

Pg. III-25

Mgt. Act.		**GENERAL DIRECTION**	**STANDARDS & GUIDELINES**
(E00)	*02*	*Provide for timber stand improvement, reforestation in sale area improvement plans, and wildlife habitat improvement.*	*a. (4) Generally include ponderosa pine, mixed conifer, aspen, and spruce fir types, and ararely oak or pinon-juniper.* b. Refer to the new **STANDARD p.** for seasonal restrictions during goshawk active nesting periods.

Pg. III-26

Mgt. Act. (E03, 06, AND 07)	01	**GENERAL DIRECTION** *Combine appropriate management activities for the timber type to provide the acceptable range of management intesity for timber production.*	**STANDARDS & GUIDELINES** a. Refer to the new **GUIDELINE h.** for vegetative treatments in goshawk post-fledgling and foraging areas.

Pg. III-27

Mgt. Act. (E03, 06 and 07)	02	**GENERAL DIRECTION** Silvicultural treatments will normally begin after the stand density index (SDI) reaches the lower management level and will be completed prior to reaching the upper management level.	**STANDARDS & GUIDELINES** *b. SC 84 plus 195 180 180 180* ---- Refer to the new **Guideline e.** for management of mature and oldgrowth stands in goshawk habitat.
	G.	Limit the maximum size opening created by timber sales to 40 acres unless: (1) Approved by the Regional Forester after a 60 day public review period, or (2)Salvaging openings created by natural events such as fire, insect or disease attack, and wind throw.	a. Refer to the new **GUIDELINE t.** for maximum size of openings in goshawk habitat.

Pg. III-43

Mgt. Act. *(P11 to 14)*	01	**GENERAL DIRECTION** .Maintain fuel conditions which permit fire suppression forces to meet protection objectives for the Management Unit.	**STANDARDS & GUIDELINES** a. Reduce or otherwise treat fuels, or break up continuous fuel concentrations, or provide added protection for areas. Refer to the new **Guideline g.** for down logs and coarse woody debris requirements in goshawk habitat.

Pg. III-21(A) ***(new pages between III-21 and III-22)***

MANAGEMENT ACTIVITY		GENERAL DIRECTION	STANDARDS & GUIDELINES
(C01)	*04*	*Manage habitat of Sensitive species to keep them from becoming threatened or endangered.*	a. ***(Guideline)*** Management actions should be designed to encourage conditions that are within the historic range of variation (HRV) as defined by Regional or local properly functioning condition (PFC) assessments. PFC operates within the range of HRV where extreme events are not desired. Actions should remain within the variability of size, intensity, and frequency of native disturbance regimes characteristic of the subject landscape and ecological processes. b. ***(Guideline)*** Within disturbed ecosystems, management actions should be designed to be consistent with restoration objectives. c. ***(Guideline)*** Utilize native plant species from locally adapted seed sources in management activities when and where practical. Non-native plant species have the potential to cause systems to move outside of historic range of variation (HRV), therefore the use of non-native species should be justified to indicate how their use is important to maintain or restore a cover type to functioning conditions. d. ***(Guideline)*** When initiating vegetative management treatments in forested cover types, provide for a full range of seral stages, by forested cover type, that achieve a mosaic of habitat conditions and diversity. Each seral stage should contain a strong representation of early seral tree species. Recruitment and sustainability of early seral tree species in the landscape is needed to maintain ecosystem resilience to perturbations. e. ***(Guideline)*** Planned vegetative management treatments (excluding unplanned and unwanted wildland fire) in the mature and/or old structural groups in a landscape that is at or below the desired percentage of land area in mature and old structural stages (40% conifer, 30% aspen), should be designed to maintain or enhance the characteristics of these structural stages. Within these landscapes the percentage of land area in mature and old structural stages treated should not move out of the mature and old structural stage. Planned treatments may vary from this guideline if the action was assessed through the biological evaluation (BE) process, and the BE concluded that the action is consistent with the intent of the Conservation Strategy and Agreement for Management of the Northern Goshawk in Utah

f. ***(Guideline)*** When initiating vegetative management treatments in forested cover types, leave the following minimum number and size of snags. If the minimum number of snags is unavailable, green trees should be substituted. If the minimum size is unavailable, then use largest trees available on site. It is desirable to have snags represented in all size classes above the minimum available on the site. The number of snags should be present at the stand level on average and, where they are available, distributed over each treated 100 acres. This distribution is needed to meet the needs of prey species that utilize this habitat.

COVER TYPE	MINIMUM SNAGS (PER 100 ACRES)	MINIMUM PREFERRED SIZE
Ponderosa Pine	**200**	**18 Inch DBH <--> 30 Feet Tall**
Mixed Conifer And Spruce/Fir	**300**	**18 Inch DBH <--> 30 Feet Tall**
Aspen	**200**	**8 Inch DBH <--> 15 Feet Tall**
Lodgepole And Aspen/Lodgepole	**300**	**8 Inch DBH <--> 15 Feet Tall**

g. (Guideline) When initiating vegetative management treatments, prescriptions should be designed to retain the following minimum amount and size of down logs and woody debris. These habitat components should be present at the stand level on average and, where they are available, distributed over each treated 10 acres. This distribution is needed to meet the needs of prey species that utilize this habitat.

COVER TYPE	Minimum Down Logs	Minimum Log Size	Minimum Coarse Woody Debris >= 3 inch diameter
	(per 10 acres) Down logs take precedence over tons of coarse woody debris	**(Diameter <---> Length) (Mid-point diameter; or if minimum size not available, largest available on the site)**	**(Tons per 10 acres, inclusive of down logs)**
Ponderosa Pine	**30**	**12 inch <--> 8 feet**	**50**
Mixed Conifer and Spruce/fir	**50**	**12 inch <--> 8 feet**	**100**
Aspen	**50**	**6 inch <--> 8 feet**	**30**
Lodgepole and Aspen/Lodgepole	**50**	**8 inch <--> 8 feet**	**50**

h. ***(Guideline)*** - Vegetative treatments designed to maintain or promote a VSS 4, 5 and/or 6 group, the percent of the group acreage covered by clumps of trees with interlocking crowns should typically range from 40-70% in post-flegling and foraging areas, and 50- 70% in nest areas. To manage outside this range, it should either be shown that the range is not within PFC for the site and the biological evaluation process determines that managing outside the range will be consistent with landscape needs of the goshawk and its prey. Use the best information available and deemed most reliable to make determinations. Groups are made up of multiple clumps of trees. Groups should be of a size and distribution in a landscape that is consistent with disturbance patterns defined in Regional or local proper functioning condition assessments (PFC). Clumps typically have 2 to 9 trees in the VSS 4, 5 or 6 size class with interlocking crowns.

i. ***(STANDARD)*** Use the latest Regionally accepted Biological Prefield Research form (USFS Region 4) to determine the level of goshawk field survey(s) needed to complete the Biological Evaluation. Completion of this form is required to document where surveys are not required.

j. ***(STANDARD)*** Where goshawk field surveys are required, complete surveys for territory occupancy within suitable habitat. Surveys will be completed during the nesting and/or post-fledgling period, and must be conducted prior to implementation of management actions.

k. ***(Guideline)*** Where goshawk field surveys are required and when project planning permits, two consecutive years of surveys for territory occupancy prior to implementation of management actions is preferred.

l. ***(Guideline)*** If a historic nest is not associated with an active nest area, management direction for home range habitat should be applied.

m. ***(STANDARD)*** When an active nest area has been identified, identify 2 alternate nest areas and 3 replacement nest areas. The next two guidelines provide recommended direction for implementation of this standard.

n. ***(Guideline)*** Each nest area (active, alternate and replacement) should be approximately 30 acres (total of approximately 180 acres) in size when sufficient suitable habitat exists. If sufficient amounts of suitable habitat are not present, use existing suitable habitat that is available.

o. ***(Guideline)*** Alternate nest areas should be identified in suitable habitat with similar vegetative structures as the active nest areas. Replacement nest areas should be identified in habitat which will develop similar vegetative structures as the active nest area at the time the active and alternate nest areas are projected to no longer provide adequate nesting habitat.

p. ***(STANDARD)*** Prohibit forest vegetative manipulation (timber harvest, prescribed burning, fuelwood, thinnings, weedings, etc.) within active nest areas (approximately 30 acres; i.e. ***Guideline n***.) during the active nesting period. The active nesting period will normally occur between March 1st and September 30 th . For non-vegetative manipulation activities (such as road maintenance, oil and gas exploration, recreation sites, etc.), adjacent to a new nest site, or a new activity adjacent to an established nest, ***Guideline*** q. applies.

q. ***(Guideline)*** In active nest areas (approximately 30 acres; i.e. ***Guideline n***.), restrict Forest Service management activities and human uses for which Forests issue permits during the active nesting period (does not include livestock permits) unless it is determined that the disturbance is not likely to result in nest abandonment. If the disturbance is likely to result in abandonment, a biological evaluation (BE) must be completed. To implement the action the BE must conclude that the action is consistent with the intent of the Conservation Strategy and Agreement for Management of the Northern Goshawk in Utah.

r. ***(Guideline)*** Forest vegetative manipulation within active, alternate and replacement nest areas should be designed to maintain or improve desired nest area habitat. Use the active nest area habitat characteristics as an indicator of the desired nest area habitat, and as the best available information for nest area habitat for that cover type.

s. ***(Guideline)*** Identify a Post-Fledgling Area (PFA) which encompasses the active, alternate and replacement nest areas and additional habitat needed to raise fledglings. A PFA should be approximately 420 acres in size (exclusive of nest area acres) when sufficient suitable habitat exists. If sufficient amounts of suitable habitat are not present, use existing suitable habitat that is available.

t. ***(Guideline)*** Forest vegetative manipulation within the PFAs should be designed to maintain or improve the same habitat features as discussed for the goshawk home range (i.e., stand structure, snags, down logs, nest trees important in the life histories of the goshawk and its prey species common to the geographic location), except:

a) Openings**, as defined in glossary and Reynolds et al.,** created as a result of mechanical vegetative treatments **(does not include wildland fire)** should not exceed the following by cover type:

Cover Type	Maximum Created Opening Size
Ponderosa Pine and Mixed Conifer	2 acres
Spruce/fir	1 acre
Aspen and Lodgepole pine	Follow current management direction

b) Management activities should be restricted during the active nesting period. The active nesting period will normally occur between March 1st and September 30th.

c) Where timber harvest is prescribed to achieve desired forest conditions, **plan the transportation system to minimize disturbance to the PFAs.** For example, small, permanent skid trails should be used in lieu of roads to minimize disturbance in goshawk PFAs. Variance may occur if it is determined that a combination of new permanent or temporary roads and permanent skid trails would result in less overall disturbance to PFA habitat.

u. ***(Guideline)*** Through the landscape assessment process identify plant communities important to goshawk prey species that contain seed, mast, and foliage components that are important to these prey species.

v. ***(Guideline)*** Where it is determined through the landscape assessment process that ungulate grazingis contributing to an identified functioning-at-risk condition relative to habitat needed to support goshawk and its prey, modify grazing practices to maintain or restore the desired seed, mast, and foliage production defined in the landscape assessment process. Review success of modifications annually. If modifications are not providing for the desired progression toward production objectives defined in the landscape assessment, modify practices through the next annual operating plan. This guideline does not apply to non-forest patches.

w. ***(Guideline)*** To help determine opportunities for habitat maintenance or enhancement for goshawk and its prey, conduct landscape analyses at the 5th to 6th order HUC or equivalent ecological scale (10's to 100's of thousands of acres). These assessments provide information concerning resource conditions, risks, and opportunities in a systematic way, thereby enhancing the agency's ability to estimate direct, indirect, and cumulative effects of management actions that may affect habtiat for the goshawk and its prey. With this information in hand, managers have a better opportunity to balance the needs of resources and humans and are less likely to negatively impact far-ranging species such as the northern goshawk or other species of concern. Essentially, actions are proposed within the context provided by the landscape assessment. As a minimum, landscape assessments should describe current status of resources, risks and opportunities (as discussed below) using the best information available locally at the time of the assessment.

- *Status* is the condition of the resources relative to the historical condition. The historical condition should be depicted through the identification of the historic range of variation (HRV) for the resource attribute of interest (i.e., forest structure, composition, canopy closure), as defined in Regional or local properly functioning condition (PFC) assessments.
- *Risk* should include both short- and long-term risks of adversely affecting the current condition of these resources (i.e., insect, disease, wildfire, human related development).
- *Opportunities* are situations where either improvements in resource condition or a reduction in risk can be achieved in a landscape through some form of subsequent management decisions. These decisions will be made either through site-specific project decisions or future adjustments in land use plans, both of which include additional analysis and public involvement.

Landscape assessments are not necessary where the Forest or project interdisciplinary team determine that the intent of the assessment has been met through other analytical processes. Meeting the intent means that sufficient information exists concerning resource conditions and risks to understand the effects (direct, indirect, and cumulative) of a proposed site-specific project on goshawk habitat relative to the broader landscape context.

x. ***(STANDARD)*** When non-vegetative management activities (for example: mineral & energy development, land exchanges, recreation facility development, ski resort construction, utility corridors, etc.) are proposed that would result in loss of suitable goshawk habitat, sufficient mitigation measures will be employed to insure an offset of the loss. The biologic al evaluation (BE) process will be used to document findings, recommend mitigation measures, and evaluate consistency with the intent of the Conservation Strategy and
Agreement for Management of the Northern Goshawk in Utah

y. ***(Guideline)*** To provide the greatest reduction in risk to loss of habitat needed to support goshawk populations across Utah, treat those acres rated as high or optimum value to goshawks and its prey that are at risk to dropping into the low or moderate value. Variance in this prioritization may occur when management objectives for goshawk habitat in concert with other resource needs, necessitate. In these cases, changes to the quality of goshawk habitat across a landscape should not impact meeting landscape habitat objectives for goshawk habitat quality, quantity and connectivity identified in the landscape assessment Clarification of Desired Habitat Conditions for Prey Species
Especially related to ungulate grazing Guideline g-28 gives direction to use the landscape assessment process to identify plant communities important to prey species that contain **seed, mast and foliage components** needed. Overall, the greatest variety of species that can produce seed and mast are assocated with mid-seral stages. Guideline g-29, then, directs that these components be maintained or restored. *The intent is to have utilization levels of grasses and forbs that maintain native foods and cover for prey species.*
Further components of desired habitat conditions for prey species from Reynolds' work, and the guidelines that address these components, include:

1. **Snags** for woodpecker feeding and nesting, mammal nests, & bird perches *(g-9)*
2. **Downed logs** for cover, feeding and nesting for a variety of prey *(g-11)*
3. **Woody debris** to provide cover and feeding for a variety of vertebrates *(g-11)*
4. **Openings** for food and cover *(g-25 for PFAs)*
5. **Large trees** for nesting, denning, feeding, roosting, cone production and hunting perches *(g-15)*
6. **Interspersion** (intermixing) of vegetative structures *(g-7 & g-15)*
7. Promotion of **aspen regeneration** *(g-5)* and growth of **native grasses** *(g-4).*

Herbaceous shrubs and intact forest soils, with emphasis on organic surface layers with natural turnover rates, are other identified components of desired habitat conditions for prey species that are not specifically included in the guidelines.
The direction in g-28 and g-29 is that, as part of the landscape assessment process and as grazing allotments are updated, all of these components be evaluated toward achievement of desired habitat conditions for prey species. Appropriate courses of action, such as a change in pasture rotation, shorter seasons of use, or reductions in numbers of livestock, would then be determined at the site-specific level. Additionally, if wild ungulate grazing is determined to be part of the problem, immediate contact with UDWR would be made for resolution

ID	Goals & Obj.	Standards & Guidelines	Question	Item to Measure	Acceptable Range	Measurement Frequency	Report Frequency
m- 1	G-10	all under the alternative goal	Are known goshawk territories on national forests remaining occupied?	Goshawk territory occupancy at the forest	Less than 20% decline in territory occupancy over a 3 year period.	Annually	Every 3 Years
m- 2	G-10	s-9 G-21	Are mitigation measures (standards and guidelines) employed during vegetative management project implementation sufficient to prevent territory abandonment?	Goshawk territory occupancy following vegetative management treatments.	No territory abandonment on projects where mitigation measures are used.	The first full breeding period following activity in all projects where pre-project surveys determined territory occupancy.	annually
m- 3	G-10	g-7	Is habitat connectivity, as represented by structural and species diversity and dispersion thereof, within and among 5th to 6th order watersheds (or equivalent ecological scale) being maintained?	Spatial dispersion and patch size of mature and old forest groups within a 5th to 6th order watershed. Tree species composition mix within mature and old groups within a landscape.	Approximately 40% of the coniferous and/or 30% of the aspen forested acres within a landscape are in VSS 5 and 6 classes. Seral species characteristic of the cover type are well represented in VSS 5 and 6 classes.	Completion of each landscape assessment	Every 5 years
m- 4	G-10	g-9	Is snag habitat (i.e., number and size of snags) being maintained in desired spatial arrangement?	Snag densities and sizes within a 100 acre block treated by mechanical or wildland fire use.	75% or more of the blocks measured meet guideline requirements.	10% or more of the acres treated within a project area, within 2 years following completion of the vegetative	Every 5 years
m- 5	G-10	g-11	Are down woody material and logs being maintained in sufficient amounts, sizes and spatial locations?	Down log and woody debris amounts and sizes within a 10 acre block treated by mechanical or wildland fire use.	75% or more of the blocks measured meet guideline requirements.	5% or more of the acres treated within a project area, within 2 years following completion of the vegetative	Every 5 years
m- 7	G-10	g-28 g-29	Are appropriate adjustments made to grazing practices in identified "at-risk" locations where grazing is contributing to the "at-risk" condition?	Ungulate grazing practices (i.e.- utilization, season of use, grazing system) in identified "at-risk" locations.	Grass, forb, and shrub production objectives are within the range identified in landscape assessments.	Grazing practices reviewed annually on at least 2 allotments where "at-risk" conditions have been identified.	Every 5 years

Appendix B

Management Indicator Species Process Paper For the Manti-La Sal National Forest

I. Introduction

This paper presents the legal requirements for selection of Management Indicator Species (MIS) from the 1982 NFMA implementing planning regulations 36 CFR 219.19, and describes past MIS for the Manti-La Sal National Forest Plan and the rationale for changes between current and proposed MIS list for the Manti-La Sal Forest Plan.

II. Legal Requirements for MIS

Federal regulation 36 CFR 219.19 requires that viable populations of all native and desirable non-native vertebrate species be maintained at the planning area level (generally considered the Forest). The regulations recommend the use of MIS populations to reflect the effects of management activities. MIS may be selected from plant and animal species that are: threatened or endangered; sensitive; ecological indicators; important for recreational, commercial, subsistence, or aesthetic values; representative of special habitats, habitat components, or plant and animal communities; and/or species that are of high concern.

The following are some of the key elements related to MIS to serve as proxies for wildlife populations.

> "Each alternative shall establish objectives for the maintenance and improvement of habitat for MIS --- to the degree consistent with overall multiple use objectives of the alternative" 219.19(a)
>
> "In order to estimate the effects of each alternative on fish and wildlife populations, certain vertebrate and /or invertebrate species present in the area shall be identified and selected as MIS and the reasons for their selection will be stated. These species shall be selected because their population change are believed to indicate the effects of management activities." 219.19(a)(1)
>
> "Planning alternatives shall be stated and evaluated in terms of both amount and quality of habitat and animal population trends of the MIS" 219.19(a)(2)
>
> "Population trends of MIS will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with State fish and wildlife agencies, to the extent practicable." 219.19(a)(6)

III. MIS Species in the Original Plan

MIS in the original Manti-La Sal National Forest Plan are listed in Table 1, below.

Table 1. Original Management Indicator Species

Type	Common Name
Mammal	Rocky Mountain elk
	Mule deer
	Abert squirrel
Type	**Common Name**
Bird	Blue grouse
	Golden eagle
Macroinvertebrate	Epeorus - Mayfly
	Zapada – Stonefly
	Ephemerella doddsi – mayfly
	Chironomidae - dipteran

IV. Proposed Deletions from Current MIS Lists

Vegetation management activities cannot simultaneously improve habitat conditions for all species; some will improve, maintain, or decline along with the species that use them, this is also true for natural disturbance events. Forest Service efforts should focus on those species and habitats that have declined or changed substantially because of past management actions and try to bring habitat to within the historic range of variability (HRV) conditions, which the species evolved with.

Blue grouse (Dendragapus obscurus)

Blue grouse are native to North America and to Utah and is an important game bird over much of its range (Weber 1975). Blue grouse are also referred to as dusky grouse, pine hen, pine grouse and fool hen. They are dark gray to blackish or blue above with mottled brown on wings. Under parts are pale blue-gray with white on sides of neck and flanks. They have a light band along the tip of their tail and a distinct white line runs from the back of their eye. Blue grouse range throughout western North America from Alaska and Canada south to Arizona (WDFW). The range of the blue grouse most closely conforms with that of the Douglas fir than any other conifer (MSU).

Life History and Habitat Requirements

Male blue grouse are approximately 21 inches long and can weigh up to 3 ½ lbs. Female blue grouse average 2 lbs. and are around 18 inches long (CDW 1979 and UDWR 1996).

Blue grouse have a "reverse" migration pattern in which they migrate up in elevation for the winter and down in the spring. Movements from summer to winter range in Utah have been as far as 5 miles (USFWS 1984). Winters are spent in dense coniferous forests feeding on fir needles and drinking snow (CDW 1979). The preferred fir they roost and feed on are *Abies spp*. and Douglas fir (*Psuedotsuga menziesii*). The USFWS (1984) habitat model suggests that blue grouse tend to be found

in the largest conifers available. Blue grouse specifically selected against low density (less than 70 trees/ha) stands of small conifers.

In the spring, birds move to lower elevations using meadows, brush or open timber. Breeding habitats were most often forests with 50% tree canopy cover that contained a discontinuous and patchy shrub layer (USFWS 1984). Despite their preference for open habitat during breeding, once occupied, a territory is generally used by a male grouse throughout his lifetime, even if the habitat structure becomes less desirable (USFWS 1984).

Males tend to migrate first either down in the spring or up in the fall. Males establish territories and strut along ecotones (edges of aspen, oak sagebrush and other vegetation types). During the mating season, which in Utah usually occurs in April, males develop an orange comb over the eye and reddish-purple air sacs on the sides of the neck. Breeding can continue through the month of June (Weber 1975). After breeding some males move back to higher elevations while others wait until late summer or fall and move up with hens and young (UDWR1996).

Hens nest on the ground under sagebrush, at the base of a tree or near logs making shallow depressions (1-2" deep and 6" in diameter) in the ground and lining it with dried leaves, twigs, grass, and feathers. Nesting usually occurs in May and June. Egg laying takes one week with incubation an additional three weeks. Their clutch size (number of eggs laid) is usually 5- 10 cream colored finely spotted eggs (Weber 1975 and UDWR 1996). Blue grouse chicks leave the nest within a few hours of hatching and remain as a group with the hen for most of the summer (Weber 1975).

Blue grouse diets vary between summer and winter. Forest habitats that are in early stages of second growth vegetation provide for summer foods which include green vegetation, seeds, buds, berries, worms, ants, beetles, spiders, and Lepidoptera larvae (Weber 1975 and USFWS 1984). Winter diet is mainly needles and buds of fir trees (CDW 1979 and UDWR 1996). A Utah study of diet for blue grouse chicks shows their diet to be almost entirely insect material and grasshoppers in particular. Chicks consumed more plant material later in the summer (Weber 1975). Plant material consumed by blue grouse includes serviceberry (*Amelanchier ulnifolia*), curlleaf mahogany (*Cercocarpos ledifolius*), and snowberry (*Symphoricarpos alnifolia*).

Since breeding grouse obtain much of their moisture from consumed vegetation, free water may not be an important factor in the location of male territories (Weber 1975). Some studies have reported frequently seeing broods along streams especially in the morning and evening. Broods may be attracted to water sources for reasons other than drinking such as high insect concentrations or because temperatures near water sources are lower (Weber 1975). Free water is not considered "required" if succulent vegetation or fruit is available (USFWS 1984).

Territory size is between 1-2 acres for male blue grouse (Weber 1975). Topography does not seem to correlate with the location or size of the territory (Weber 1975). Two primary requirements of territories according to Weber (1975) is escape cover provided by thick sagebrush or trees and openness to allow for males to display.

No major reduction in blue grouse range has occurred since historical times in Utah or throughout western North America. Fluctuations in population do occur annually and are generally tied to weather patterns (UDWR1996). Cool wet springs, dry summers, and harsh winters tend to depress grouse production.

Although the blue grouse depends heavily on coniferous cover, its preferred habitat also includes a number of deciduous tree species, shrubs, and forbs. Foremost among the broadleaf trees is aspen (*Populus tremuloies*). Current information regarding blue grouse populations in southeast Utah can be located in the Utah Upland Game Annual Report, obtained from the UDWR.

Habitat Characteristic	Blue Grouse
Winter Habitat	Spruce/Fir, mainly Douglas fir and true firs
Summer (Breeding/Brooding) Habitat	Meadows, brush or open timber; Rangelands with vegetation averaging 8 inches tall
Nesting Habitat	Shallow depression on ground at base of tree, log, brush
Foraging Habitat	Winter feed-fir needles & buds; Summer feed-insects and plant material. Openings no more than 820 feet in diameter. Areas comprised of 11-40% broadleaf forbs.
Water	Some dependence, but specifics are not clear

Management Effects

Livestock grazing - Deferred or moderate grazing preserves nesting, feeding, and brood cover. Fenced exclosures particularly around water sources, protect vegetative cover, food and water, important for blue grouse (MSU). Intense grazing of open lowland forests reduces the quality and availability of breeding habitat (WDFW). Streams, springs, and wet meadows should be safeguarded from potential damage due to livestock grazing. Grazing should be managed for maximum forb production. Grazing intensity should be light enough to allow grass/forb vegetation to reach a standing height of 8 inches and even up to 12 inches in brooding areas. Moderate grazing from May through August or grazing deferred until after August first would preserve nesting, brooding, and feeding cover (WDFW).

Timber harvest - Selective and small clearcut logging may be beneficial to blue grouse when it opens the canopy and allows for regeneration of thickets. These harvest methods can create uneven-aged timber stands with numerous 20-60 year old thickets where even-aged stand once stood (WDFW). Existing thickets may, however, be destroyed during road building and log removal operations, and large areas of slash left after logging are not used by blue grouse (USFWS 1984). If clear cut logging is performed, cleared blocks no greater than 60 acres may benefit blue grouse by opening up canopy cover and regenerating new thickets for food and brood rearing (MSU). Others recommend clearcuts smaller than 820 feet across and leaving at least 40 trees/ha with a minimum of 9 inches dbh on wintering areas (WDFW). Selective cuts or long rotations greater than 60 years are also thought to be better for wintering blue grouse than clear cuts (WDFW). Winter roost areas should be retained, including mature, mistletoe-laden Douglas fir thickets near ridges (WDFW). Reforestation practices that include high density replanting, herbicide application, and fertilization results in rapid tree canopy closure reducing blue grouse habitat suitability (WDFW). Reseeding following logging should include adapted grasses and legumes that provide succulent forage for grouse.

Fire - Blue grouse densities in mature coastal forests are low, but populations generally increase quickly following logging or burning (USFWS 1984). This population increase is followed by 10-25 years of stability and then a rapid population decline due to increased forest density. Using fire to open forest floors, particularly in the mid elevation areas, may improve breeding habitat (WDFW).

Rationale for Removal from MIS List

Blue grouse is a MIS in the Manti-La Sal Land and Resource Management Plan. Federal regulation 36 CFR 219.19 requires that viable populations of all native and desirable non-native vertebrate species be maintained at the planning area level (generally considered the Forest). The regulations recommend the use of MIS populations to reflect the effects of management activities. Blue grouse do not meet the purpose of MIS for four primary reasons: They are vegetation generalists, hunted species, middle of food chain, and have no survey protocol.

Vegetation Generalist: Although blue grouse can be affected by forest management activities, such effects are typically not exclusive, nor rarely even primary. Vegetation management, for example, may alter blue grouse habitat, but because blue grouse use a variety of habitat types, they can adjust to utilize altered habitat or other habitats. Thus, timber harvest activities may displace blue grouse through disturbance and in some cases habitat lost, but blue grouse will likely remain in the area as long as a variety of key habitat components (forage, cover, movement corridors, security area) are present. They may also move to other habitat types where their needs are also met (USFWS 1984).

Hunted Species: Blue grouse are a hunted species and are affected by hunting season regulations (daily bag limits and season length). Both sexes are allowed to be harvested. Hunting regulations are set by the Utah Division of Wildlife Resources (UDWR).

Middle of Food Chain: Coyotes, hawks, and foxes are known to be predators of the blue grouse. The extent to which predation affects blue grouse is unknown, so the extent of annual predation on blue grouse is difficult to predict. Because blue grouse occur in the middle of the food chain (it feeds on plant and insect material but also has many predators feeding on them) its population is impacted by predators more than if it were higher in the food chain.

No Survey Protocol: It has been difficult to obtain reliable cost-effective population data on the blue grouse since the UDWR stopped monitoring this species in the early 1990's. In addition, there is no standard protocol for survey and monitoring of blue grouse. This means that data collected in one part of the state can not necessary be used to compare or combine with data obtained in another part of the state. No large-scale trend or predictions can be made.

Cumulatively, state wildlife agency decisions on daily harvests and season length, predation and availability of diverse habitat can greatly influence blue grouse populations. Hunting season regulations, predation, even the affects of weather [which UDWR (1996) has determined directly influences population fluctuations in blue grouse] are outside the administrative control of the Forest Service. The Forest Service can exert control over vegetation management on forest administered lands. However, this factor alone is not influential enough to correlate to blue grouse population fluctuations (USFWS 1984). Therefore, blue grouse do not meet the intent of CFR 219.19 to use MIS populations to reflect the effects of management activities.

V. Proposed MIS for the Forest Plan Amendment

The proposed species to replace blue grouse as an MIS in the amendment is listed with the supporting rational for its' selection below.

Northern Goshawk (*Accipiter gentilis*)

Northern goshawks (goshawk) are native to North America and are the largest North American member of the Accipiter family. These birds are about 19 inches in length with a wingspan of 42 inches. Females are much larger than males. Adult birds have red eyes, blackish head and face. Gray back and upper wings and white under tail. Chin, throat and chest are pale gray. Immature birds have yellow eyes, brown head, back, upper wings and upper tail with white streaked belly. Goshawks range throughout the Northern Hemisphere from boreal forests of Alaska and Canada to montane forests of Mexico, occurring as a permanent resident in Utah (UDWR).

Life History and Habitat Requirements

In North America, goshawks occur in mature conifer, deciduous and mixed forest types. These forests contain a wide variety of forest ages and success ional stages. Food and nesting habitat, as with many raptors, are frequently the principal factors limiting goshawk densities (USDA 1992). These factors are directly and indirectly influenced by changes in habitat composition, structure, or function due to ecological processes and or management activities.

Because the goshawk is large in size and wing span, it seldom uses young, dense forests. These birds depend on large trees to place their nest having sufficient space below the canopy to fly and capture prey yet dense canopy above to avoid predators (USDA 1992).

Goshawks are partly migratory, they will migrate south if northern forest foods are scarce and they will migrate from high to lower elevations in pinyon-juniper forests during the winter. Some goshawks in the southwest winter on or near their nesting home range (USDA 1992, USDA 1999).

Goshawk diets consist of small to medium birds and mammals from robins and chipmunks to grouse and hares, which it captures on the ground or in the air. A single goshawk requires about 4.2 to 5.3 ounces of food per day or the equivalent of about 1-2 birds (USDA 1992).

Goshawks appear to be monogamous. Nesting females lay and then incubate a single clutch of two to four eggs for 32-34 days (UDWR 1996). Young are able to fly at about five to six weeks of age but remain dependent on their parents for food until they reach 10 weeks of age (UDWR).

According to Hargis et al. 1994, goshawk home ranges are influenced by the location of permanent springs and small streams. In areas where these types of water are uncommon, it may be difficult for all nesting goshawks to establish territories in proximity to water. This increases the importance of the next nearest available well-canopied water source. The study by Hargis showed a greater association of nest sites to permanent water than post-fledging home ranges. One telemetry bird developed an elongated home range to include the closest spring. Her movements showed 50% of the locations were divided between the nest stand and this spring.

USDA (1999) quotes Squires and Reynolds, (1997) that "Nests are often located near the bottom of moderately steep slopes, close to water and often adjacent to a canopy break".

Most goshawks nest in mid-high elevation ranges in Utah (6,000-10,000 feet). In general, goshawks nest in mature to old forests with relatively large trees, high canopy closure, sparse groundcover and

open understories (USDA 1999). Goshawks in the southwest commonly use 2-4 alternate nests distributed within 30 acre nest stands. Female home ranges are significantly smaller than male home ranges (Kennedy et al. 1994). Nest areas are occupied by both the male and female goshawk from early March through late September. Breeding territories have been estimated to be around 420 acres is size, not including nesting territories. Foraging areas are larger (5,000-6,000 acres).

The Manti-La Sal National Forest Management Plan currently includes management direction to guide forest activities in goshawk habitat. These guidelines were recently upheld in a decision by Gloria Manning, Reviewing Officer for the Chief of the Forest Service, dated February 10, 2003 (Appeal #00-13-0-0003, USDA 2003). A website showing analyses pertaining to these guidelines is found at fsweb.r4.fs.fed.us. The forest guidelines are found in Appendix A.

Habitat Characteristic	Northern Goshawk
Winter Habitat	Spruce/fir/aspen, pinyon/juniper/cottonwood (USDA1999)
Summer (Breeding/Brooding) Habitat	Mature to old forests with relatively large trees, high canopy closure, sparse ground cover, open understories.
Nesting Habitat	Mature to old forests with relatively large trees, high canopy closure, sparse ground cover, open understories, large downed woody debris and scattered small forest openings. Nests near bottom of steep slope, running water and adjacent to a canopy break. Nest made of sticks near tree trunk between branch forks (USDA 1999).
Foraging Habitat	Winter and summer feed are small to large birds and mammals such as rabbits, squirrels, songbirds, and grouse. Closed canopy forests with moderate tree densities. Often forages from forest edge by small openings
Water	Nests usually located near perennial stream

Management Effects

Livestock grazing - Although forage for livestock is not abundant in mixed spruce/fir forests, there can be an impact when aspen is a component of the forest. Livestock can remove young aspen stems and reduce their ability to regenerate. Aspen is a key nesting factor for northern goshawks. Often, goshawk nests are located in aspen stringers within riparian areas where livestock tend to congregate. Small forest openings are important since goshawks feed on birds and mammals. Standards for forage utilization should be maintained to provide for habitat for goshawk prey in both riparian, aspen, and small open meadow habitats (Appendix A, guideline v).

Timber harvest - Although goshawks can breed successfully in forests where timber harvesting has occurred (USDA 1999) they prefer stands of mature and over-mature trees for nesting and foraging. Large-scale fire suppression activities have resulted in dense small-size forest thickets and caused the aspen component in our western forests to diminish. Thinning forests from below can help improve habitat for goshawks by opening up lower canopy levels and providing for large mature trees. Harvest

methods used to regenerate aspen forests also provide for long-term benefits to goshawks. Details of timber harvest restrictions and guidelines is found in Appendix A.

Fire - Burning to achieve many of the same objectives listed above under timber harvest can benefit northern goshawk habitat. Historic fires in goshawk habitat were typically low-intensity ground surface fires maintaining large trees, open forest floors and aspen. Conditions today include dense small tree thickets and encroaching conifer trees into aspen patches resulting in catastrophic fire conditions which could cause extensive damage to goshawk habitat over large areas.

Rationale for using Northern Goshawk as MIS

The proposed action is to amend the Manti-La Sal Forest Plan by replacing blue grouse with the northern goshawk as a Management Indicator Species. The Forest would also replace the Manti-La Sal Forest Plan language related to blue grouse with language for the goshawk.

Vegetation Specialist: The northern goshawk depends on mature conifer and mixed conifer forests for all aspects of life, with the exception of those individual birds that migrate to lower elevations for winter months. Goshawks are sensitive to ecological changes because all or most life stages rely on mature spruce/fir/aspen forests, particularly for breeding success. Although mature conifer forests have been considered a limiting factor for blue grouse production, nesting success is tied to lower elevation habitats. Because of this, the goshawk would be a better indicator of change in this forest type providing a definite link between the bird and its habitat. Changes occurring any time of the year to this habitat type could be directly linked to goshawk impacts.

Non-Hunted Species: The northern goshawk is not a hunted species, therefore its population is not artificially controlled.

Top of Food Chain: The goshawk is considered to be near the top of the food chain, reducing the number of predators that can impact its population. The Great horned owl and larger raptors are primary predators. The extent to which predation affects goshawks can be monitored since the loss occurs mostly to young. Nests are monitored and the death of young determined when possible.

Established Survey Protocol: A survey protocol for goshawks has been established. It is considered an interim regional protocol with the national protocol out soon. Data to monitor populations at regional levels providing information on large-scale ecological impacts/changes exists with northern goshawks since they are of regional concern and have an established survey protocol.

Cumulatively, fewer factors out of the control of the Forest Service play a part in determining impacts to goshawk populations. The Forest Service can exert control over vegetation management on forest administered lands which, alone, is influential enough to correlate to goshawk population fluctuations (USFWS 1984).

For the reasons listed above, the Forest believes that the goshawk would meet the MIS criteria listed under CFR 219.19 (a)(1) and would be a good MIS for the Manti-La Sal National Forest.

Other Species Considered but Eliminated from Detailed Analysis

Three other species were considered as possible MIS to replace blue grouse; the gray jay, Three-toed woodpecker, and Red squirrel but for different reasons were not selected as MIS.

Replace Blue Grouse with Gray Jay.

Gray Jay

The difficulty in surveying and monitoring for this species lies in locating their nest during winter months when travel is difficult. No protocol for survey and monitoring has been established and their preference for gathering around campgrounds may alter population estimates. In addition, their dependence on young trees (CWS) does not meet the need to monitor the health of large old and mature conifer and mixed conifer forests, which was the intent of having blue grouse as an indicator species to start with. For the reasons listed above the gray jay was not thought to be a good MIS for the Manti-La Sal National Forest.

Replace Blue Grouse with Three-toed Woodpecker.

Three-toed Woodpecker

A survey protocol and monitoring requirements have not been established. In addition, finding actual nest sites is very difficult since they consist usually of a small hole in the bole of an aspen tree. If one is lucky enough to locate a nest site, seeing eggs, young and fledglings is very difficult creating unreliable results in nesting success. Finally, three-toed woodpeckers change nest locations each year, therefore long-term monitoring of known nest sites does not get easier once one is found. This species would be very difficult to monitor for nesting success. Monitoring for population stability is also difficult since the presence of this bird is highly dependent on bark beetle infestations. For the reasons listed above the three-toed woodpecker was not thought to be a good MIS for the Manti-La Sal National Forest.

Replace Blue Grouse with Red Squirrels

Red Squirrels

No protocol for survey and monitoring of red squirrels has been established. Monitoring for nests located in woodpecker holes provides the same problem as monitoring for three-toed woodpeckers nests… difficult to find, and does not provide biologists with the opportunity to survey for nesting success by comparing number of young born with number of young leaving the nest. For the reasons listed above the red squirrel was not thought to be a good MIS for the Manti-La Sal National Forest.

VI. Monitoring

Monitoring of blue grouse as a MIS was identified on page IV-6 of the Forest Plan. The following table outlines what has been expected:

Data Source and/or	Expected	Measurement	Reporting	Variation resulting

Monitoring Technique	Reliability	Frequency	Period	in further evaluation
Harvest Records	M	Annual	5 Year	Twenty Percent
Spring Territory Surveys	M	Annual	5 Year	Twenty-five Percent
Summer Brood Counts	M	Annual	5 Year	Twenty-five Percent

Exchanging blue grouse with northern goshawk would result in the following monitoring requirements, taken directly out of the Conservation Strategy and Agreement for the Management of Northern Goshawk Habitat in Utah (Utah National Forests et al. 1998, pages 9-10).

1. Tracking changes in goshawk habitat over time

   This type of monitoring will occur on state and federal lands, statewide. Each National Forest will monitor its forested landscapes for the attributes described in the DHC statements provided earlier (Desired Habitat Condition in the Conservation Strategy, ie. early seral tree species, habitat connectivity, large trees, stand level characteristics such as snags and down woody debris, and a variety of vegetative structural stages). At the Forest level this is accomplished by identifying changes in habitat caused by management activities or natural events. When conditions at the Forest level are trending away from DHCs, appropriate corrective actions will be developed and implemented. Results of Forest-level monitoring will also be aggregated to a central repository at the state level in order to monitor the quality and connectivity of statewide habitat. State-wide assessments will also be completed during programmatic planning activities such as Land Resource Management Plan revisions.

2. Implementation and effectiveness monitoring

   This monitoring will be conducted to verify that projects are properly implementing the strategy, and that they are effective in creating desired habitat conditions for goshawk and it's prey. It will be part of the design of every project affecting goshawk habitat on National Forest system lands. Time periods and indicators for monitoring will vary depending upon the purpose of the project. Time periods and indicators at the project level will be documented within individual project records. At the Forest and statewide levels, monitoring will track the net change in availability and connectivity of high value goshawk habitat. This monitoring will be reviewed annually at the state level to determine if the strategy is being successfully implemented or if changes are needed.

3. Population Monitoring

   Concurrent with habitat monitoring, Forests will monitor goshawk territory occupancy. Data will be collected and analyzed at the Forest level and shared with the Utah Division of Wildlife Resources for aggregation to larger scales, including the State. A territory is considered occupied if evidence of goshawk use is present. Nesting does not need to occur for a territory to be occupied. Each agency will be responsible for maintaining and updating their respective population databases, and coordinate findings annually.

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Appendix C

Responses to Scoping Comments

Note: USFWS and Utah State Lands (Local and State Offices) commented with statements of support for the Proposed Action.

Southeast Utah Land Users

Comment #1: Don't want junk science to replace common sense like what happened with spotted owl.

Response #1: The Proposed Action draws on a large body of science referenced in Appendix B, pg. XX.

Southern Utah Wilderness Alliance and Red Rock Forests

Comment #1: The goshawk does not occupy similar habitat as blue grouse. Blue grouse covers a range of elevations and ecotones. Goshawk monitoring would only detect impacts from a limited range of proposed actions.

Response #1: This comment highlights our concern with blue grouse as a MIS. Because the blue grouse uses a variety of elevations and ecotones, it is not best used to detect effects to a specific habitat type, in this case mature conifer/mixed conifer. The Forest Plan uses other MIS (deer and elk) for other habitat types.

Comment #2: Forest Service should have created a monitoring plan for blue grouse 16 years ago when it was selected as an MIS. Forest Service should have taken over the responsibility when DWR quit.

Response #2: The Planning Regulations (36 CFR 219.19) do not direct the Forest Service specifically to develop monitoring plans for all MIS. Until the UDWR terminated monitoring of blue grouse, data was available to meet the intent of MIS. However we acknowledge that given limited monitoring resources, this data gap set the stage for evaluating the overall effectiveness of blue grouse as a MIS. The analysis documented in this environmental assessment provides the basis for deciding whether or not to re-initiate monitoring of blue grouse for MIS purposes.

Comment #3: Partners in flight show a decline in blue grouse east of Utah.

Response #3: Blue grouse are showing declines in some areas in North America. Depending on their management (ie. Hunting, transplanting, etc.) those areas may want to use blue grouse as a MIS. This is not the situation on Utah forests.

Paula Wellnitz

Comment #1: If we protect mature and old forests for goshawks then we'll increase timber harvest of young trees to make up the difference.

Response #1: There is no correlation between the choice of MIS and how much timber is removed in what form from the forest. MIS are not intended to highlight the need for habitat protection. Instead they are intended to assist us in monitoring effects of management activities in various habitats.

Utah Environmental Congress

Comment #1: The Forest Plan states that blue grouse are tied to several vegetative types and serves as an indicator for them all. Too many differences between blue grouse and goshawk to equate one for the other.

Response #1: Please see Response to Comment #1, SUWA/Red Rock Forests above.

Comment #2: Reason for the switch is failure on the Forest Service part to do the required monitoring.

Response #2: Please see Response to Comment #2, SUWA/Red Rock Forests above.

Comment #3: Why is the far more abundant blue grouse more difficult to monitor? The Forest Service is already required to monitor goshawks so is this merely a convenience move?

Response #3: Difficulty of monitoring is not the concern. One reason the blue grouse is abundant is because it is adaptive to such a wide variety of habitat types. Therefore management impacts to a specific type such as mature conifer/mixed conifer could go undetected based on blue grouse population monitoring. Rather the concern is that there is no standard monitoring protocol and even if there were, blue grouse population changes cannot be linked directly to the specific habitat. Given that monitoring under a standard protocol is already on-going for the northern goshawk which depends specifically on this habitat, it is prudent for the Forest Service to consider selecting this species to replace a less effective MIS for which there is no current monitoring.

Comment #4: The FSM states that MIS must be chosen using input from state and federal wildlife agencies, experts from universities and private organizations. Was this done?

Response #4: Yes, our scoping included 244 agencies, specialists, individuals and interest groups.

Comment #5: We must show that "scientific evidence exists" confirming that measurable changes in these species (MIS) would indicate trends in the condition of biological communities they are representing. What "evidence" exists that goshawks are now better than blue grouse?

Response #5: Appendix B, Management Indicator Species Process Paper For the Manti-La Sal National Forest and the associated list of references provides the scientific basis for the environmental analysis. Documentation clearly shows that numerous factors affect blue grouse populations that the Forest Service has no control over (ie. hunting, transplants, predation, weather, etc.). These factors add to the complexity of determining if an impact

has occurred and what has caused the impact. These factors are less complex using northern goshawks as MIS.

Comment #6: Biased decision making is already evident since the scoping letter refers to this as a "non-significant" amendment.

Response #6: Use of the term non-significant is in reference to Forest Plan amendment (not to be confused with significant *effects* under NEPA. These are addressed in the Decision Notice and Finding of No Significant Impact). 36 CFR 219.10 (f) states …"the Forest Supervisor shall determine whether a proposed amendment would result in a significant change to the plan." The Decision Notice, under the heading **Findings Required by Other Laws and Regulations**, includes a determination considering factors outlined in Forest Service Handbook 1909.12**.**

Comment #7: Proposal violates NFMA and mandate to consider impacts to diversity and other resources through use of MIS.

Response #7: The purpose and need for the proposed amendment is precisely to bring the selected MIS into better alignment with the intended use from the NFMA.

Appendix D

Protocol name: Goshawk Inventory and Survey
Target species: Northern Goshawk
Non-target species recorded: Other Raptors
Years used: 1993 to present
This protocol is: __X_ current ____ obsolete
Source: USDA Forest Service interdisciplinary working group Region 4

Name/location of field data dictionary (if any): None

Purpose (survey objectives and intended uses for the data):
The purpose of goshawk inventories is to identify suitable habitat as well as locate nest sites. The goshawk is a species of concern, so locating suitable habitat and nesting pairs is important for proper management of the species. The data gained from inventories will be used in monitoring efforts and forest and wildlife management.

Survey design (transect placement and spacing, etc.):
Once suitable habitat has been delineated, transects should be placed 260 meters (850 feet) apart and the calling stations should be 300 meters (985 feet) apart along each transect. Depending on topography, you may want/need to make some alterations. The main point is to design the survey both for efficiency and complete coverage. Stations should should be called (visited) twice in a given year unless first survey reveals occupancy or sub-optimal habitat.

Field methods (directions for conducting survey, including equipment specifications):
Goshawks generally respond more frequently to broadcast vocalization during the nestling period. The nestling period is usually late May through mid-July. Responses can be solicited throughout the day. For calling, a small megaphone/CD player unit should be used. Be sure that the call you are using is appropriate to the current nesting phase. Upon arriving at a calling station, look and listen for 1-2 minutes before calling. When calling, be sure to only play it at the volume you would expect from an adult goshawk. Hold the megaphone about head height. The alarm call should play for 10 seconds then a 30 second pause, rotate 120 degrees for the next vocalization but continue to look and listen in all directions for an approaching goshawk. Males tend to approach silently and females tend to approach while vocalizing. The tape will then begin the second 10 second broadcast alarm call. When the 30 second pause begins, rotate another 120 degrees. After the third and final 10 second alarm call, remain at the station for 30 seconds to look and listen for a response. If none is heard, continue to next calling station.

If a response is heard/seen, stop the broadcast immediately and record the direction and compass bearing of the approach or vocalization. To avoid excess disturbance, leave the area and concentrate survey efforts on transects away from goshawk vocalization or sighting.

Modifications (describe any changes/variations from the original protocol and when/where the modified protocol was used): Added in 2001: "Stations should be called twice in a given year unless first survey reveals occupancy or sub-optimal habitat."

Data sheets: Inventory Form (currently used – contains all the same data as the original forms from 1993); Original Definitions. Attach maps to all data sheets showing all survey points, response locations, nests, and other pertinent information.

INTRODUCTION:

A working group was established by the Intermountain Region (R4) in 1993, to create a conservation assessment of northern goshawk habitat in R4. The working group is chaired by Ron Rodriquez and includes Steve Anderson, Tim Craig, Brian Ferguson, John Erickson, Jim Kelley, Shane Jeffries, Robin Garwood, and Wend Reinmuth. The group met on April 13, 1993 at the Regional Biologist and Botanist Workshop in Salt Lake City, Utah. At the meeting the group determined that its first task would be to prepare a document displaying survey protocol and field inventory forms for northern goshawks. This document would be distributed to biologists throughout R4 prior to the 1993 field season to expedite regional consistency and shared information in conducting field surveys for northern goshawks.

This document describes suitable goshawk nesting habitat, suggested equipment to conduct surveys, a specific protocol for conducting goshawk surveys, likely indicators of goshawk nesting activity, and field forms for goshawk inventories, monitoring, and nest searches.

SUITABLE GOSHAWK NESTION HABITAT

The literature describes goshawk nests as frequently occurring on gentle or moderate slopes (0-30%) with northerly exposures (NW-NE) (Reynolds et al. 1982). Nest areas are also described as containing or adjacent to quiet or ephemeral streams or springs. Nest sites were typically located on the lower portion of the slope, near water (Reynolds 1983). Goshawk nests in Oregon were in stands ranging from those with closed, mature canopies with few shade-tolerant understory trees, to stands with more open, mature canopies and many understory trees (Reynolds 1983). High percent canopy closures coupled with northerly aspects produce shady, cool conditions below the forest canopy. Bartelt (1974), McGowan (1975), and Reynolds et al. (1982) found that goshawks require trees with big limbs to support their large nests, and tended to place their nests in one of the larger trees in the nest area. In Oregon, goshawks nests in 150+ year old conifer stands (Reynolds 1983).

In Nevada, a typical goshawk nest is located in aspen stringers near perennial streams. Over 85% of documented nesting activity in Nevada occur in aspen vegetative communities. About 98% of the observed nests occur within 100 feet of water. A typical goshawk nest in Nevada occurs in mature trees, 35-50 feet tall. Within a nesting territory, there are usually numerous nests that were constructed in previous years (Heron et al. 1985). Aspen used as nest trees are typically the largest in the stand and or located northerly or easterly exposures where terrain is not steep (4-39%) (Younk and Bechard 1992).

EQUIPMENT:

The equipment described in this section only relates to broadcast vocalization surveys for northern goshawks and assumes that all proper outdoor and safety gear are provided by the unit and/or the individual conducting the survey (i.e. hardhat, boots etc.) Furthermore, equipment mentioned in this section is only recommended because of its wide use and performance. **It should be noted that other audio equipment manufacturers produce callers that are probably adequate.**

Audio Equipment: Currently the most widely used wildlife callers are modified and distributed by James Garey. The package includes a megaphone produced by Radio Shack which is selected because of its light weight, clarity of sound, and broad range. The megaphone is modified by Garey to

include: a three foot cable with a stereo phone plug, a switch to select between microphone and tape player, and the removal of the musical functions. Cost of the megaphone in $95.00 plus shipping.

The cassette player is a Sony Sports Walkman selected for its weather resistance and reliability. Sony's standard jack has been replaced with a highly durable stereo phono connector appropriate for rugged use. The cost of the cassette player is $80.00 plus shipping.

Garey also offers a fanny pack with a specially fitted pocket for accessible operation of the tape player, a Velcro strap and hard plastic clip plate for secure carrying, and a zippered back pouch for carrying accessories. The cost of the cassette player belt back is $40.00 plus shipping.

To order, contact: James Garey
516 99th Ave. NE
Bellevue, WA 98004-9413
(206) 637-9573

Or buy a Radio Shack bullhorn and take it and an old caller (for an example) down to an electronic shop and have them modify it for you.

Vocalization Tapes: We recommend that vocalization tapes be recorded from compact disk. Peterson Field Guides to Western Bird Songs from Cornell Laboratory of Ornithology/Interactive Audio is preferred because it includes songs and calls of 522 birds including all of the birds which occur on the Region 4 sensitive species list. The compact disk offers superior clarity and minimizes the background noise and feedback which often occur when recording tape to tape.

We recommend recording from compact disk to a high quality cassette tape made specifically for recording from compact disks. These tapes can be purchased at retailers which sell cassette tapes. Record an entire sequence of calls which will occur at a calling station on the cassette tape and include pauses. For example, the northern goshawk protocol requires that at each calling station the warning call will be played for 10 seconds then a 30 second pause occurs. This sequence continues three times at each calling station.

Field technicians should be able to push the play button on the cassette and allow it run until all three sequences at the calling station have been completed. This will allow the technician to concentrate on looking and listening for an approaching bird instead of rewinding the tape and timing the pause. This will also reduce the wear and tear on the cassette player and the tape since the cassette is only rewound once when the broadcast has been completed at a calling station. If noise from the megaphone is impairing to the observer during a pause, simply release the trigger on the megaphone until the next vocalization is about to begin.

Once the entire sequence has been recorded from compact disk to a high quality tape, we recommend that the broadcast be recorded from the high quality cassette tape to a 7 ½ minute (or shorter) cassette tape. Shorter length cassette tapes are thicker and thus more durable to continual play and field use. If a short length field tape is damaged or destroyed simply record the sequence from the high quality cassette tape to another short length field tape. If the high quality cassette tape begins to wear out simply purchase a new one and re-record the sequence from the compact disk.

To Order Peterson Field Guides to Western Bird Songs, contact:

Bird Watchers Digest
PO Box 110
Marietta, OH 45750
(800) 879-2473

cost: $40.00 = shipping

To order short length cassette tapes check your yellow pages for retailers who specialize in recording or cassette tapes and compact disks or contact

Custom Recording & Sound, Inc.
3907 Custer Drive
Boise, ID 83705
(208) 344-3535

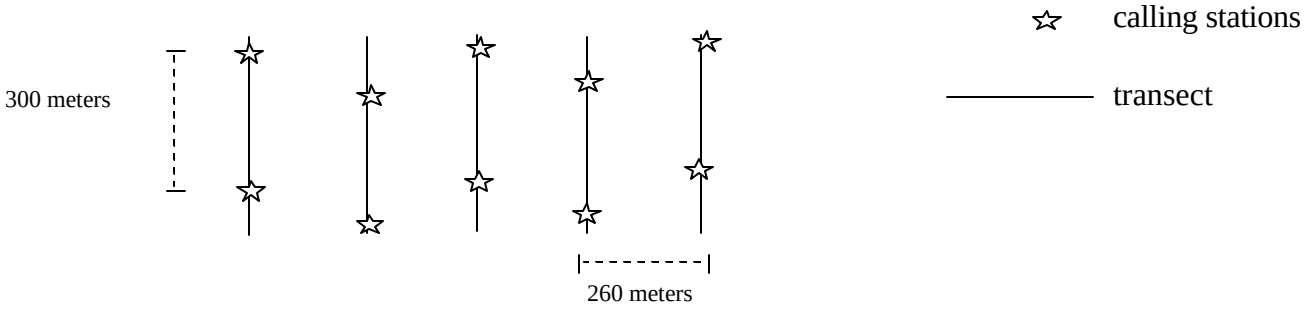
cost: about 85 cents per tape

This past spring (1993), the Regional Office sent out vocalization tapes to all units in the region. **These tapes are of a lower quality than those described above, however they are adequate if the caller is capable of producing adequate volume to achieve coverage between transects.**

OCCURRENCE SURVEY PROTOCOL

Goshawks respond more frequently to broadcast vocalization during the nestling period than the fledgling period in some areas of the Region. Optimal survey times (nestling period) occur from late May thru mid-July. Within the Southern portions of the Region responses were more frequent during the fledging period July-September. Responses can be solicited throughout the day. Survey all suitable goshawk nesting habitat in the analysis area (more intensive surveys may include area adjacent to or beyond suitable habitat). Once suitable nesting habitat has been delineated, identify survey routes or transects so that they lie about 260 meters apart (850 feet). Locate calling stations every 300 meters (985 feet) along each transect (Figure 1).

Figure I



It may be desirable to modify this survey design to better fit local topography and vegetation patterns in some areas. For example, in steep terrain, incised by long narrow drainages, calling stations may be spaced further than 300 meters apart when a transect occurs in a ravine that is so narrow that birds across the ravine can hear the recordings. In this instance, both sides of the ravine are being called from one transect. Similarly, on steep hillsides or where patches of appropriate nesting habitat are scattered, transect lines or calling stations may be placed further apart to accommodate patches of habitat. The important point is to design the survey for efficiency but also to ensure that complete coverage is achieved.

Upon arriving at a calling station, look and listen for 1-2 minutes. If no observations occur begin the broadcast vocalization tape holding the megaphone in a fixed position about head high (it is important to note that the broadcast should only be played at about the same volume as you would expect to hear from an adult northern goshawk). The alarm call should play for 10 seconds then a 30 second pause will occur (Joy et al. 1993 and Kennedy et al. 1993). During the pause, rotate 120 degrees for the next vocalization but continue to look and listen in all directions for an approaching goshawk. There is no difference in response rates during the nesting of fledging period between males and females; however, males tend to approach silently while females tend to approach while vocalizing. The tape will then begin the second 10 second broadcast alarm call. When the 30 second pause begins rotate another 120 degrees to face a new direction and look and listen for an approaching goshawk. After the third and final 10 second alarm call has been played remain at the calling station for 30 seconds to look and listen for a response (Joy et al. 1993). If none are heard continue to the next calling station and repeat the process.

If a vocalization or sighting of a goshawk occurs stop the broadcast immediately and record the direction and compass bearing of the approach or vocalization. To avoid excessive disturbance to the nesting pair, leave the area and concentrate survey efforts on transects away from goshawk vocalization or sighting. use the compass bearing and direction of approach for subsequent nest searches. Remember to send documented sightings of northern goshawks to the Conservation Data Center (CDC). We recommend providing CDC observation report forms to field crews prior to field surveying so that information on the form can be recorded at the location of the observation and sent in immediately.

GOSHAWK INVENTORY AND PRIORITIZATION

INVENTORY:

Inventory suitable habitat for habitat modifying projects. Use the following approach:

1. Forests are required to complete at least one year of survey for all habitat manipulation projects with decision notices signed before July 1, 1994.
2. Because goshawks change nest locations frequently, two years of survey are strongly recommended. Whenever possible conduct two years of survey for all habitat manipulation projects with decision notices signed after July 1, 1994. At a minimum, Forests are required to conduct one year of survey.
    a. If a goshawk nest area is found during the first year of inventory, establish a management unit. A second year of inventory is not needed.
    b. If goshawks are not found during the first year of inventory, and suitable habitat (nesting, fledging or foraging) exists, conduct an inventory the following year.

3. Conduct a complete inventory based on the protocol as described in this document where existing or historic nests have been located or in high priority stands (see prioritization section below).
4. Conduct a "walk through" in low and medium priority stands (see prioritization section below). If plucking perches, molted feathers, nests, goshawk vocalizations are encountered while conducting a "walk through", conduct a complete inventory based upon the protocol found in this document.

PRIORITIZATION:

1. Identify stands as "high" priority if successional stages 5 and 6 (based on tree species and site capability) dominate the stand.

2. Identify stands as "medium" priority if successional stages 4 (based on tree species and site capability) dominate the stand.

3. Identify stands as "low" priority if successional stages 1-3 (based on tree species and site capability) dominate the stands.

INDICATORS OF ACCIPITER NESTING ACTIVITY

The following indicators are not definite indicators of accipiter nesting in the area, but the presence of any or all of these indicators suggest more intensive surveys may be necessary. These indicators should be noted along with a precise description of the location of their occurrence.

1. **Presence of "plucking perches"**. Accipiters often deplume prey before it is taken to the nest. The object used as a perch is usually a downed log, leaning tree or a stump. These perches can be inconspicuous. However, the presence of some scattered prey feathers, blood and/or an accipiter defecation (slice) indicate that a perch has been used in this manner and its location should be noted.

2. **Molted accipiter feathers**. Since nesting birds molt flight and body feathers it is important to record the location of any feathers found while in the field. Since feather identification can be difficult it is suggested that crew members carry plastic sandwich bags and collect feathers for later verification by a knowledgeable ornithologist. It is important to be sure that anyone who collects migratory bird feathers is covered by the proper State and Federal collectors permits since the possession of most bird feathers is prohibited by Federal Law.

3. **Hunger begging vocalizations**. Young accipiters vocalize loudly in the presence of their parents even late in the summer. Field crews should become familiar with these sounds and record the location of any vocalizations heard. The chances of hearing vocalizations by nestlings is greatest in the morning and evening.

4. **Presence of Adults**. The location of any accipiter observed should be recorded. In addition, the behavior of these birds should be noted. Vocalizations or aerial defense in the presence of another raptor, the presences of an accipiter soaring up out of or diving

into the woods or the presence of two adults or a single adult which does not immediately flee from humans in the early nesting season could all indicate an active nesting territory.

5. **"White-wash" below a tree**. The presence of multiple defecations below a tree should always be noted and the location of the tree precisely recorded. The presence of accipiter "white-wash" will persist even into the late fall.

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Manti – La Sal National Forest – Northern Goshawk Inventory Data Form

Analysis Area						**Date:**			
Observers:			**Time Begin:**			**Time End:**			
Effort: (Circle one)	1st yr of survey		2nd yr of survey			**Visit #** (Circle one):	One	Two	
Follow-up to unsuccessful monitoring?	Yes	No	**Territory Name:**						
Weather:	Wind	Precipitation	None	Lt Drizzle	Rain	Fog			
Stage: (Circle one)	Courtship	Incubation	Nestling	Fledgling	Other				
Call Used: (Circle one)	Alarm	Wail	Fledgling begging						

Transect#	**Station #**	**Start time**	**Total time**	**Response?**	**A/V**	**Direction**	**Age/Sex**	**Forest type**	**Comments**

Observation Summary

Goshawks detected	Yes	No	Total #	Ad. male	Ad female	unknown	nestlings	fledglings
Nest Search conducted	Yes	No	Nest located	Yes	No	Alternate nest	New territory	

Codes: Detected- Use 4-leter common name code for species responding (e.g. NOGO, COHA, GRJA, etc.); A/V- A = audio detection, V = visual detection; Age – A = adult, N = nestling, F = fledgling, U = unknown; Sex – m = male, f = female, U = unknown; Forest type – Use 4-letter code (e.g. PIEN, POTR, PIPO, etc.).

Definition of Terms from Goshawk Inventory and Monitoring Protocol

Johnsgard, P. 1990. Hawks, Eagles, & Falcons of North America. Smithsonian Inst. Press, Washington.

Active Nest. A nest known to have contained incubated eggs. A nest need not be successful to be considered active. The number of "active nests" is an important unit of measure for comparisons among years, study areas, treatments, and experimental areas. INCUBATING or BROODING is indicated by an adult (almost always the female) sitting on the nest.

ALTERNATE NEST. In this context: A nest at which a nest attempt has been documented at sometime in the past and is within 1 mile (may be in adjacent tree) of another nest that has also had a nest attempt.

COURTSHIP BEHAVIOR. Described fully in Johnsgard 1990. Includes aerial displays of "high circling", "slow flapping", "undulating flight", "sky dance", or diving and chasing flights by the pair.

FAILED NEST. An active nest in which the eggs or nestlings are lost (e.g. to predators, weather) or abandoned by the adult(s). No young fledged.

NATIONAL I.D.#. The number begins with the Region #, followed by: Forest #, Ranger District #, and Goshawk Territory #. An example would be R03F02D0110. This means Region 3, Caron National Forest, Canjilon Ranger District, Goshawk Territory #10.

NEST ATTEMPT. An attempt to nest as evidenced by observed courtship behavior within a nest site or new nest construction or reconstruction of an old nest (addition of new sticks or greenery).

NEST SITE. In this context: The nest, nest tree, and area surround the nest that includes the stand of trees containing prey handling areas, perches, and roosts. Synonymous with "micro-nest site" which includes the immediate nest area. (As opposed to macro-nest site which includes 10-30 acres of area around the nest.)

NEST TREE. The tree containing the nest.

SUCCESSFUL NEST. A nest from which at least one young is fledged.

TERRITORY OCCUPIED. In monitoring, an auditory or visual confirmation of adult goshawks near previous nest stands during the Courtship Period confirms territory occupancy.

VISIT #: Visit number at the site within the current year.

Determining Age of Goshawks

ADULT. Birds in their definitive plumage. See Johnsgard 1990 for description. Males: Iris orange-red, becoming deeper red to mahogany in older adults. Females: Iris orange-yellow in older adults.

SUBADULT. (sexes alike) Similar to adults, but see Johnsgard 1990. An individual in a plumage condition transitional between its juvenile and definitive plumage. The term is also sometimes used more loosely to refer to all fledged individuals that have not yet reached their definitive plumage ("immature birds"). Iris remains bright yellow until about the fourth year, and some juvenile brown may be retained until the second year. Initial breeding may occur at two or three years, even occasionally at one year. Unless observer is positive of SUBADULT status, consider all breeding birds as adults.

JUVENILE. (sexes alike) A bird exhibiting part or all of its first plumage of nondowny feathers (juvenile plumage).

FLEDGLINGS are JUVENILES that have recently attained the power of flight and are still dependent on the adults.

NESTLINGS. Unfledged birds still in the nest. Older NESTLINGS may have a portion of their juvenile plumage and thus are JUVENILES. Young NESTLINGS exhibit all downy plumage.